Short-Stay Quality Measures

14:16 Thursday, August 23, 2001   The SAS System

The LOGISTIC Procedure

Model Information

Data Set	RES.SHORTSTAY
Response Variable	Congestive Heat Failure Rehospitalization
Number of Response Levels	2
Number of Observations	593587
Link Function	Logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	qmchf	Total Frequency
1	Yes	31226
2	No	562361

NOTE: 95064 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	244698.69	217258.06
SC	244709.98	217348.42
-2 Log L	244696.69	217242.06

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	27454.6236	7	<.0001
Score	30216.4178	7	<.0001
Wald	23814.1033	7	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

Parameter	DF	Standard Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-3.7527	0.0575	4263.7393	<.0001
Congestive Heart Failure	1	1.8640	0.0134	19236.4082	<.0001
Hypertension+Complications	1	0.3933	0.0195	408.6675	<.0001
Respiratory Disease	1	0.2778	0.0127	480.6484	<.0001
Barthel ADL Score	1	-0.00815	0.000279	852.7821	<.0001
Do Not Resuscitate	1	-0.3620	0.0133	746.2267	<.0001
Feeding Tube Present	1	0.1678	0.0192	76.4683	<.0001
Age At Assessment	1	0.00242	0.000677	12.7479	0.0004

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
Congestive Heart Failure	6.449	6.282	6.621
Hypertension+Complications	1.482	1.426	1.539
Respiratory Disease	1.320	1.288	1.353
Barthel ADL Score	0.992	0.991	0.992
Do Not Resuscitate	0.696	0.678	0.715
Feeding Tube Present	1.183	1.139	1.228
Age At Assessment	1.002	1.001	1.004

Association of Predicted Probabilities and Observed Responses

Percent Concordant	75.0	Somers' D	0.522
Percent Discordant	22.8	Gamma	0.533
Percent Tied	2.1	Tau-a	0.052
Pairs	17560284586	c	0.761

The LOGISTIC Procedure

Model Information

Data Set   RES.SHORTSTAY
Response Variable   Electrolyte Imbalance Rehospitalization
Number of Response Levels   2
Number of Observations   593587
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	qmeleci	Total Frequency
1	Yes	31635
2	No	561952

NOTE: 95064 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	247057.81	237180.42
SC	247069.10	237304.66
-2 Log L	247055.81	237158.42

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	9897.3834	10	<.0001
Score	10499.3257	10	<.0001
Wald	9821.6760	10	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

Parameter	DF	Standard Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-2.5745	0.0544	2241.8038	<.0001
Congestive Heart Failure	1	0.3513	0.0123	820.9540	<.0001
Dysphagia	1	0.0371	0.0212	3.0663	0.0799
Renal Failure	1	0.4632	0.0175	702.4623	<.0001
Barthel ADL Score	1	-0.0150	0.000391	1464.0922	<.0001
Do Not Resuscitate	1	-0.4281	0.0131	1064.1160	<.0001
Feeding Tube Present	1	0.2484	0.0182	186.3565	<.0001
Bedfast	1	0.0611	0.0164	13.9739	0.0002
Cognitive Performance Scale	1	0.0109	0.00310	12.3675	0.0004
Requires Assistance To Eat	1	0.2586	0.0169	235.0889	<.0001
Age At Assessment	1	-0.00012	0.000618	0.0379	0.8457

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
Congestive Heart Failure	1.421	1.387	1.455
Dysphagia	1.038	0.996	1.082
Renal Failure	1.589	1.536	1.645
Barthel ADL Score	0.985	0.984	0.986
Do Not Resuscitate	0.652	0.635	0.669
Feeding Tube Present	1.282	1.237	1.328
Bedfast	1.063	1.030	1.098
Cognitive Performance Scale	1.011	1.005	1.017
Requires Assistance To Eat	1.295	1.253	1.339
Age At Assessment	1.000	0.999	1.001

Association of Predicted Probabilities and Observed Responses

Percent Concordant	65.0	Somers' D	0.320
Percent Discordant	33.0	Gamma	0.327
Percent Tied	2.0	Tau-a	0.032
Pairs	17777351520	c	0.660

The LOGISTIC Procedure

Model Information

Data Set   RES.SHORTSTAY
Response Variable   Respiratory Infection Rehospitalization
Number of Response Levels   2
Number of Observations   593587
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	qmrespi	Total Frequency
1	Yes	24456
2	No	569131

NOTE: 95064 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	203887.72	191158.50
SC	203899.01	191260.14
-2 Log L	203885.72	191140.50

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	12745.2205	8	<.0001
Score	15045.1892	8	<.0001
Wald	13014.0405	8	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

		Standard			
Parameter	DF	Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-2.9673	0.0245	14651.7159	<.0001
Congestive Heart Failure	1	0.4753	0.0136	1230.2969	<.0001
Dysphagia	1	0.1013	0.0217	21.9107	<.0001
Do Not Resuscitate	1	-0.3953	0.0145	745.9167	<.0001
Feeding Tube Present	1	0.7150	0.0187	1459.9742	<.0001
Bedfast	1	0.1045	0.0181	33.1868	<.0001
Barthel ADL Score	1	-0.0163	0.000461	1247.9675	<.0001
Cognitive Performance Scale	1	0.0120	0.00334	12.9017	0.0003
Requires Assistance To Eat	1	0.2759	0.0197	195.6548	<.0001

Odds Ratio Estimates

	Point	95% Wald	
Effect	Estimate	Confidence Limits	
Congestive Heart Failure	1.609	1.566	1.652
Dysphagia	1.107	1.061	1.155
Do Not Resuscitate	0.673	0.655	0.693
Feeding Tube Present	2.044	1.971	2.120
Bedfast	1.110	1.071	1.150
Barthel ADL Score	0.984	0.983	0.985
Cognitive Performance Scale	1.012	1.005	1.019
Requires Assistance To Eat	1.318	1.268	1.370

Association of Predicted Probabilities and Observed Responses

Percent Concordant	68.6	Somers' D	0.395
Percent Discordant	29.2	Gamma	0.404
Percent Tied	2.2	Tau-a	0.031
Pairs	13918667736	c	0.697

The LOGISTIC Procedure

Model Information

Data Set   RES.SHORTSTAY
Response Variable   Sepsis Rehospitalization
Number of Response Levels   2
Number of Observations   593587
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	qmsepsi	Total Frequency
1	Yes	10185
2	No	583402

NOTE: 95064 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	103005.74	95434.369
SC	103017.03	95524.721
-2 Log L	103003.74	95418.369

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	7585.3682	7	<.0001
Score	9239.4901	7	<.0001
Wald	7741.6451	7	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

		Standard			
Parameter	DF	Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-3.8035	0.0378	10112.5860	<.0001
Renal Failure	1	0.7546	0.0267	799.4926	<.0001
Do Not Resuscitate	1	-0.6312	0.0228	768.4554	<.0001
Feeding Tube Present	1	0.5690	0.0263	466.4997	<.0001
Bedfast	1	0.3811	0.0272	195.7919	<.0001
Barthel ADL Score	1	-0.0179	0.000742	578.9196	<.0001
Cognitive Performance Scale	1	0.00785	0.00488	2.5865	0.1078
Requires Assistance To Eat	1	0.3533	0.0306	133.4553	<.0001

Odds Ratio Estimates

	Point	95% Wald	
Effect	Estimate	Confidence Limits	
Renal Failure	2.127	2.018	2.241
Do Not Resuscitate	0.532	0.509	0.556
Feeding Tube Present	1.767	1.678	1.860
Bedfast	1.464	1.388	1.544
Barthel ADL Score	0.982	0.981	0.984
Cognitive Performance Scale	1.008	0.998	1.018
Requires Assistance To Eat	1.424	1.341	1.512

Association of Predicted Probabilities and Observed Responses

Percent Concordant	70.8	Somers' D	0.463
Percent Discordant	24.6	Gamma	0.485
Percent Tied	4.6	Tau-a	0.016
Pairs	5941949370	c	0.731

The LOGISTIC Procedure

Model Information

Data Set   RES.SHORTSTAY
Response Variable   Urinary Track Infection Rehospitalization
Number of Response Levels   2
Number of Observations   593587
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	qmuti	Total Frequency
1	Yes	20906
2	No	572681

NOTE: 95064 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	180978.02	171451.60
SC	180989.31	171553.25
-2 Log L	180976.02	171433.60

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	9542.4163	8	<.0001
Score	9955.3659	8	<.0001
Wald	8945.4493	8	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

Parameter	DF	Standard Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-2.4498	0.0637	1481.1421	<.0001
Dysphagia	1	-0.0364	0.0248	2.1603	0.1416
Congestive Heart Failure	1	0.2993	0.0149	403.4870	<.0001
Do Not Resuscitate	1	-0.4305	0.0158	742.2403	<.0001
Feeding Tube Present	1	0.3893	0.0206	358.5372	<.0001
Barthel ADL Score	1	-0.0242	0.000470	2658.4233	<.0001
Cognitive Performance Scale	1	0.0192	0.00356	28.9718	<.0001
Requires Assistance To Eat	1	0.1394	0.0205	46.1655	<.0001
Age At Assessment	1	-0.00261	0.000740	12.4187	0.0004

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
Dysphagia	0.964	0.919	1.012
Congestive Heart Failure	1.349	1.310	1.389
Do Not Resuscitate	0.650	0.630	0.671
Feeding Tube Present	1.476	1.418	1.537
Barthel ADL Score	0.976	0.975	0.977
Cognitive Performance Scale	1.019	1.012	1.026
Requires Assistance To Eat	1.150	1.104	1.197
Age At Assessment	0.997	0.996	0.999

Association of Predicted Probabilities and Observed Responses

Percent Concordant	68.1	Somers' D	0.385
Percent Discordant	29.6	Gamma	0.394
Percent Tied	2.3	Tau-a	0.026
Pairs	11972468986	c	0.692

Long-Stay Quality Measures

14:22 Tuesday, September 11, 2001   The SAS System

The LOGISTIC Procedure

Model Information

    Data Set   LRES.LONGSTAY
    Response Variable   Functional Improvement
    Number of Response Levels   2
    Number of Observations   339802
    Link Function   Logit
    Optimization Technique   Fisher's scoring

Response Profile

    Ordered   Total
     Value   fnctimpr   Frequency

      1   1   32484
      2   0   307318

NOTE: 326160 observations were deleted due to missing values for the response or explanatory
    variables.

Model Convergence Status

    Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

                        Intercept
               Intercept   and
    Criterion   Only   Covariates

    AIC   214280.54   205479.37
    SC   214291.27   205565.26
    -2 Log L   214278.54   205463.37

Testing Global Null Hypothesis: BETA=0

    Test   Chi-Square   DF   Pr > ChiSq

    Likelihood Ratio   8815.1697   7   <.0001
    Score   8562.8373   7   <.0001
    Wald   8058.8564   7   <.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

Parameter	DF	Standard Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-1.8711	0.0399	2203.3809	<.0001
Age At Assessment	1	-0.00882	0.000503	307.5839	<.0001
Barthel Index (25 to 70)	1	0.9006	0.0137	4304.5489	<.0001
Incontinence, Bowel	1	0.0960	0.0143	45.2086	<.0001
Cognitive Perf. Scale >=4	1	-0.6909	0.0176	1541.7507	<.0001
Do Not Resuscitate	1	-0.2325	0.0124	350.1098	<.0001
Visual Impairment	1	-0.1226	0.0175	49.2558	<.0001
Bed Mobility (>=3)	1	0.3034	0.0145	440.7132	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
Age At Assessment	0.991	0.990	0.992
Barthel Index (25 to 70)	2.461	2.396	2.528
Incontinence, Bowel	1.101	1.070	1.132
Cognitive Perf. Scale >=4	0.501	0.484	0.519
Do Not Resuscitate	0.793	0.774	0.812
Visual Impairment	0.885	0.855	0.915
Bed Mobility (>=3)	1.355	1.317	1.393

Association of Predicted Probabilities and Observed Responses

Percent Concordant	65.0	Somers' D	0.313
Percent Discordant	33.8	Gamma	0.316
Percent Tied	1.2	Tau-a	0.054
Pairs	9982917912	c	0.656

The LOGISTIC Procedure

Model Information

Data Set   LRES.LONGSTAY
Response Variable   Incident Pressure Ulcer Stage 2+
Number of Response Levels   2
Number of Observations   461264
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	decubitu	Total Frequency
1	1	14575
2	0	446689

NOTE: 204698 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	129389.95	122135.21
SC	129400.99	122212.50
-2 Log L	129387.95	122121.21

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	7266.7432	6	<.0001
Score	7071.6889	6	<.0001
Wald	5933.3800	6	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

Parameter	DF	Standard Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-5.0669	0.0655	5990.4680	<.0001
Age At Assessment	1	0.00460	0.000770	35.7021	<.0001
Ambulation Dependent	1	0.6992	0.0276	642.8953	<.0001
Body Mass Index <21	1	0.2108	0.0173	147.9352	<.0001
Cognitive Perf. Scale >=4	1	0.0942	0.0186	25.6320	<.0001
Transfer Assistance Needed	1	0.6088	0.0313	378.6986	<.0001
Bed Mobility (>=3)	1	0.5211	0.0209	620.9302	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
Age At Assessment	1.005	1.003	1.006
Ambulation Dependent	2.012	1.906	2.124
Body Mass Index <21	1.235	1.193	1.277
Cognitive Perf. Scale >=4	1.099	1.059	1.140
Transfer Assistance Needed	1.838	1.729	1.954
Bed Mobility (>=3)	1.684	1.616	1.754

Association of Predicted Probabilities and Observed Responses

Percent Concordant	68.0	Somers' D	0.399
Percent Discordant	28.2	Gamma	0.414
Percent Tied	3.8	Tau-a	0.024
Pairs	6510492175	c	0.699

The LOGISTIC Procedure

Model Information

Data Set   LRES.LONGSTAY
Response Variable   Resisting Care Improvement
Number of Response Levels   2
Number of Observations   133274
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	rzstimpr	Total Frequency
1	1	39290
2	0	93984

NOTE: 532688 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	161636.48	159766.77
SC	161646.28	159815.77
-2 Log L	161634.48	159756.77

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	1877.7151	4	<.0001
Score	1843.3538	4	<.0001
Wald	1819.8315	4	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

Parameter	DF	Standard Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.5364	0.0116	2150.1596	<.0001
Incontinence, Bladder	1	-0.0839	0.0138	37.1367	<.0001
Cognitive Perf. Scale >=4	1	-0.2426	0.0135	322.8769	<.0001
Abusive Behavior, Physical	1	-0.1582	0.0153	106.5646	<.0001
Abusive Behavior, Verbal	1	-0.3809	0.0139	749.6246	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
Incontinence, Bladder	0.920	0.895	0.945
Cognitive Perf. Scale >=4	0.785	0.764	0.806
Abusive Behavior, Physical	0.854	0.828	0.880
Abusive Behavior, Verbal	0.683	0.665	0.702

Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.6	Somers' D	0.148
Percent Discordant	36.8	Gamma	0.167
Percent Tied	11.6	Tau-a	0.062
Pairs	3692631360	c	0.574

The LOGISTIC Procedure

Model Information

Data Set   LRES.LONGSTAY
Response Variable   Incident Skin Trauma
Number of Response Levels   2
Number of Observations   212022
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	skintrau	Total Frequency
1	1	22490
2	0	189532

NOTE: 453940 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	143425.26	137625.93
SC	143435.53	137728.57
-2 Log L	143423.26	137605.93

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	5817.3365	9	<.0001
Score	5248.6563	9	<.0001
Wald	4989.9621	9	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

| | | Standard | | | |
| | | Standard | | | |
Parameter	DF	Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-4.6713	0.0725	4150.9081	<.0001
Age At Assessment	1	0.0198	0.000723	749.5242	<.0001
Barthel Index	1	-0.00696	0.000525	176.0669	<.0001
Body Mass Index <21	1	0.2215	0.0147	227.4969	<.0001
Cognitive Perf. Scale >=4	1	0.0926	0.0179	26.7513	<.0001
Do Not Resuscitate	1	0.0695	0.0155	20.1179	<.0001
White	1	0.9295	0.0278	1119.3516	<.0001
Transfer Assistance Needed	1	0.1395	0.0253	30.3520	<.0001
Bed Mobility (>=3)	1	0.0541	0.0197	7.5624	0.0060
Resists Care	1	0.2734	0.0163	281.7732	<.0001

Odds Ratio Estimates

| | Point | 95% Wald | |
| | Estimate | Confidence Limits | |
Effect	Estimate	Confidence Limits	
Age At Assessment	1.020	1.019	1.021
Barthel Index	0.993	0.992	0.994
Body Mass Index <21	1.248	1.212	1.284
Cognitive Perf. Scale >=4	1.097	1.059	1.136
Do Not Resuscitate	1.072	1.040	1.105
White	2.533	2.399	2.675
Transfer Assistance Needed	1.150	1.094	1.208
Bed Mobility (>=3)	1.056	1.016	1.097
Resists Care	1.314	1.273	1.357

Association of Predicted Probabilities and Observed Responses

Percent Concordant	64.5	Somers' D	0.300
Percent Discordant	34.5	Gamma	0.303
Percent Tied	1.0	Tau-a	0.057
Pairs	4262574680	c	0.650

The LOGISTIC Procedure

Model Information

Data Set   LRES.LONGSTAY
Response Variable   Weight Loss below danger threshold
Number of Response Levels   2
Number of Observations   274496
Link Function   Logit
Optimization Technique   Fisher's scoring

Response Profile

Ordered Value	wghtloss	Total Frequency
1	1	17094
2	0	257402

NOTE: 391466 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	128015.71	126344.97
SC	128026.24	126397.59
-2 Log L	128013.71	126334.97

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	1678.7389	4	<.0001
Score	1621.1798	4	<.0001
Wald	1600.0084	4	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

| | | Standard | | | |
Parameter	DF	Estimate	Error	Chi-Square	Pr > ChiSq
Intercept	1	-4.6611	0.0621	5639.1297	<.0001
Age At Assessment	1	0.0213	0.000744	817.8049	<.0001
Ambulation Dependent	1	0.1473	0.0187	61.9565	<.0001
Incontinence, Bowel	1	0.2076	0.0193	115.4519	<.0001
Eating (>=3, Exten. Asst.)	1	0.1961	0.0211	86.1738	<.0001

Odds Ratio Estimates

| | Point | 95% Wald | |
Effect	Estimate	Confidence Limits	
Age At Assessment	1.021	1.020	1.023
Ambulation Dependent	1.159	1.117	1.202
Incontinence, Bowel	1.231	1.185	1.278
Eating (>=3, Exten. Asst.)	1.217	1.167	1.268

Association of Predicted Probabilities and Observed Responses

Percent Concordant	57.8	Somers' D	0.186
Percent Discordant	39.2	Gamma	0.192
Percent Tied	3.0	Tau-a	0.022
Pairs	4400029788	c	0.593